CLAIMS

What is claimed is:

1. An optical element comprising:

a substrate which is ~~generally~~ transparent to infrared radiation in a wavelength range of 5-16 μm;

a pigment disposed in said substrate in an amount that does not ~~generally~~ decrease transmission of said infrared radiation, said pigment being ~~generally~~ non-transmissive to at least one of visible and ultraviolet light, said pigment being reactable with said substrate over time to create a reaction product which can decrease transmission of said infrared radiation; and

a protective agent disposed in said substrate in an amount that does not ~~generally~~ decrease transmission of said infrared radiation and which ~~generally~~ prevents creation of the reaction product which can decrease transmission of said infrared radiation.

2. The optical element according to claim 1 wherein said protective agent is mixed with said pigment.

3. The optical element according to claim 1 wherein said pigment is coated with said protective agent such that said pigment ~~generally~~ does not contact said substrate.

4. The optical element according to claim 1 wherein said pigment has a property of oxidizing said substrate so as to create an oxidation product which can decrease transmission of said infrared radiation, and said protective agent has a property of reacting with said pigment so as to prevent said pigment from oxidizing said substrate, and wherein said protective agent is mixed with said substrate and said pigment in an amount sufficient to ~~generally~~ prevent oxidation of said substrate by said pigment.

5. The optical element according to claim 1 wherein said substrate comprises polyethylene.

6. The optical element according to claim 1 wherein said substrate comprises high density polyethylene.

7. The optical element according to claim 1 wherein said pigment comprises zinc sulfide.

8. The optical element according to claim 1 wherein said protective agent comprises zinc oxide.

9. The optical element according to claim 1 wherein the amount of said pigment relative to the amount of said protective agent is in a range between 1:4 and 4:1 inclusive.

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10. The optical element according to claim 1 wherein said pigment and said protective agent comprise particles in a size range of 0.5-6 μm.

11. The optical element according to claim 1 wherein said protective agent is pigmentary.

12. The optical element according to claim 1 wherein said protective agent is non-pigmentary.

13. A passive infrared detector assembly comprising:

an optical element comprising:

a substrate which is ~~generally~~ transparent to infrared radiation in a wavelength range of 5-16 μm;

a pigment disposed in said substrate in an amount that does not ~~generally~~ decrease transmission of said infrared radiation, said pigment being ~~generally~~ non-transmissive to at least one of visible and ultraviolet light, said pigment being reactable with said substrate over time to create a reaction product which can decrease transmission of said infrared radiation; and

a protective agent disposed in said substrate in an amount that does not ~~generally~~ decrease transmission of said infrared radiation and which ~~generally~~ prevents creation of the reaction product which can decrease transmission of said infrared radiation;

an infrared sensor positioned relative to said substrate such that infrared radiation can impinge upon said sensor after passing through said optical element, said sensor providing an output signal indicative of received infrared radiation; and

alarm apparatus operatively connected to said sensor which produces an alarm signal based upon the output signal of said sensor.

14. The assembly according to claim 13 wherein said protective agent is mixed with said pigment.

15. The assembly according to claim 13 wherein said pigment is coated with said protective agent such that said pigment ~~generally~~ does not contact said substrate.

16. The assembly according to claim 13 wherein said pigment has a property of oxidizing said substrate so as to create an oxidation product which can decrease transmission of said infrared radiation, and said protective agent has a property of reacting with said pigment so as to prevent said pigment from oxidizing said substrate, and wherein said protective agent is mixed with said substrate and said pigment in an amount sufficient to ~~generally~~ prevent oxidation of said substrate by said pigment.

17. The assembly according to claim 13 wherein said substrate comprises polyethylene.

18. The assembly according to claim 13 wherein said substrate comprises high density polyethylene.

19. The assembly according to claim 13 wherein said pigment comprises zinc sulfide.

20. The assembly according to claim 13 wherein said protective agent comprises zinc oxide.

21. The assembly according to claim 13 wherein the amount of said pigment relative to the amount of said protective agent is in a range between 1:4 and 4:1 inclusive.

22. The assembly according to claim 13 wherein said pigment and said protective agent comprise particles in a size range of 0.5-6 μm.

23. The assembly according to claim 13 wherein said protective agent is pigmentary.

24. The assembly according to claim 13 wherein said protective agent is non-pigmentary.

25. A lens for a passive infrared detector assembly, the lens comprising:

a substrate which is ~~generally~~ transparent to infrared radiation in a wavelength range of 5-16 μm;

a pigment disposed in said substrate in an amount that does not ~~generally~~ decrease transmission of said infrared radiation, said pigment being ~~generally~~ non-transmissive to at least one of visible and ultraviolet light, said pigment being reactable with said substrate over time to create a reaction product which can decrease transmission of said infrared radiation; and

a protective agent disposed in said substrate in an amount that does not ~~generally~~ decrease transmission of said infrared radiation and which ~~generally~~ prevents creation of the reaction product which can decrease transmission of said infrared radiation.

26. The lens according to claim 25 wherein said protective agent is mixed with said pigment.

27. The lens according to claim 25 wherein said pigment is coated with said protective agent such that said pigment ~~generally~~ does not contact said substrate.

28. The lens according to claim 25 wherein said pigment has a property of oxidizing said substrate so as to create an oxidation product which can decrease transmission of said

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infrared radiation, and said protective agent has a property of reacting with said pigment so as to prevent said pigment from oxidizing said substrate, and wherein said protective agent is mixed with said substrate and said pigment in an amount sufficient to ~~generally~~ prevent oxidation of said substrate by said pigment.

29. The lens according to claim 25 wherein said substrate comprises polyethylene.

30. The lens according to claim 25 wherein said substrate comprises high density polyethylene.

31. The lens according to claim 25 wherein said pigment comprises zinc sulfide.

32. The lens according to claim 25 wherein said protective agent comprises zinc oxide.

33. The lens according to claim 25 wherein the amount of said pigment relative to the amount of said protective agent is in a range between 1:4 and 4:1 inclusive.

34. The lens according to claim 25 wherein said pigment and said protective agent comprise particles in a size range of 0.5-6 μm.

35. The lens according to claim 25 wherein said protective agent is pigmentary.

36. The lens according to claim 25 wherein said protective agent is non-pigmentary.